HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P. O. Box 272400
Fort Collins, Colorado 80527-2400

PATENT APPLICATION AF

ATTORNEY DOCKET NO. 10010559-1

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Guillermo A. ALVAREZ et al. **Confirmation No.:** 1174

Application No.: 09/843,882 **Examiner:** Yigdall, Michael

Filing Date: April 30, 2001 **Group Art Unit:** 2122

Title: METHOD AND SYSTEM FOR ONLINE DATA MIGRATION ON STORAGE SYSTEMS WITH PERFORMANCE GUARANTEES

Mail Stop Appeal Brief-Patents
Commissioner For Patents
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Sir:

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on **April 1, 2005**.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) $500.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

( ) (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d) for the total number of months checked below:

( )	one month	$120.00
( )	two months	$450.00
( )	three months	$1020.00
( )	four months	$1590.00

( ) The extension fee has already been filled in this application.

(X) (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account **08-2025** the sum of **$500.00**. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees. A duplicate copy of this sheet is enclosed.

(X) I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, Alexandria, VA 22313-1450. Date of Deposit: **June 1, 2005**

OR

( ) I hereby certify that this paper is being transmitted to the Patent and Trademark Office facsimile number_____ on _____

Number of pages:

Typed Name: **Judy H. Chung**

Signature: _____

Respectfully submitted,

Guillermo A. ALVAREZ et al.

By _____

Timothy B. Kang

Attorney/Agent for Applicant(s)
Reg. No. **46,423**

Date: **June 1, 2005**

Telephone No.: **(703) 652-3817**

PATENT
Atty Docket No.: 10010559-1

In The U.S. Patent and Trademark Office

In Re the Application of:

Inventor(s):	Guillermo A. ALVAREZ et al.	**Confirmation No.:**	1174
Serial No.:	09/843,882	**Examiner:**	Michael J. Yigdall
Filed:	April 30, 2001	**Group Art Unit:**	2122
Title:	METHOD AND SYSTEM FOR ONLINE DATA MIGRATION ON STORAGE SYSTEMS WITH PERFORMANCE GUARANTEES		

MAIL STOP APPEAL BRIEF-PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

CERTIFICATE OF MAILING WITH THE USPTO

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, Alexandria, VA 22313-1450. This correspondence contains the following document(s):

1 sheet of Transmittal Letter for Appeal Brief (2 copies).

27 sheets of Appeal Brief including Appendices (3 copies).

Respectfully submitted,

MANNAVA & KANG, P.C.

Date of Deposit
June 1, 2005

Timothy B. Kang
Reg. No.: 46,423

MANNAVA & KANG, P.C.
8221 Old Courthouse Road
Suite 104
Vienna, VA 22182
(703) 652-3817
(703) 880-5270 (facsimile)

HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, Colorado 80527-2400

HPNO.: 10010559-1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s):	Guillermo A. Alvarez et al.	**Confirmation No.:**	1174
Serial No.:	09/843,882	**Examiner:**	Michael J. Yigdall
Filed:	April 30, 2001	**Group Art Unit:**	2122
Title:	METHOD AND SYSTEM FOR ONLINE DATA MIGRATION ON STORAGE SYSTEMS WITH PERFORMANCE GUARANTEES		

MAIL STOP APPEAL BRIEF-PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

Appellants respectfully submit this Appeal Brief in response to the final Official Action mailed on January 3, 2005 and the Advisory Action mailed on March 22, 2005.

TABLE OF CONTENTS

I. INTRODUCTION

A. Real Party in Interest

The real party in interest with respect to this appeal is the Hewlett-Packard Company, the named assignee in this application.

B. Related Appeals and Interferences

There are no interferences or other appeals related to this application or this appeal.

C. Status of Claims

Claims 1-23 stand rejected, and Claims 1-23 are at issue on this appeal.

Claims 1-23 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 6,636,951 to Tachikawa in view of U.S. Patent No. 6,230,239 to Sakaki et al.

This application was originally filed with twenty (20) claims, of which, Claims 1, 11, and 16 are independent. Responsive to the first Official Action, an Amendment was filed setting forth amendments to Claims 1, 11, and 16 and presenting new Claims 21-23, of which Claim 23 is independent. This Amendment was entered into the record.

An Official Action was mailed on January 3, 2005 indicating that Claims 1-23 are finally rejected. In response to the final Official Action, a Response was filed presenting arguments for consideration by the Examiner; no amendments were made to Claims 1-23.

An Advisory Action was mailed on March 22, 2005 indicating that Claims 1-23 are rejected. Thus, Claims 1-23 are currently pending in this application.

Pursuant to 37 C.F.R. § 41.37, Appellant hereby appeals the Examiner's decision finally rejecting Claims 1-23 to the Board of Patent Appeals and Interferences. Therefore, all claims pending in this application are at issue on this appeal.

D. Status of Amendments

A Request for Reconsideration was filed subsequent to the issuance of the final Office Action. That Request for Reconsideration did not include any amendments to the claims.

A copy of the claims at issue on appeal is attached as the Claims Appendix.

II. SUMMARY OF CLAIMED SUBJECT MATTER

Generally speaking, the present invention pertains to a system and method for modifying the rate at which data is moved, such that, foreground applications may meet their performance goals during the data migration. More particularly, for instance, the rate at which the data is migrated may be dynamically varied such that the resources utilized to perform the foreground applications is not utilized for the data migration.

Claim 1 of the present invention pertains to a method for migrating data employing the above-identified data migration rate control. In the method of Claim 1, a set of data is moved in a data storage system (130) of a computer system (100). *Specification*, page 8, lines 6-16 (discussing migration engine 110). While the set of data is moved, a performance of at least one executing application (140) is monitored. *Specification*, page 9, lines 27 and 28 (discussing monitor module 310). A change in the rate at which the set of data is moved is calculated in response to the monitored performance of the at least one executing application (140). *Specification*, page 13, lines 4-8 (discussing step 508 in Figure 5). In addition, the

rate at which the set of data is moved is modified in accordance with the calculated change. *Specification*, page 9, lines 12-16 (discussing migration executor 200).

Claim 11 of the present invention pertains to a system for migrating data on a computer system (100). The system includes a monitor (310) configured to monitor a performance of at least one application (140) executing on the computer system (100). The system also includes a controller (320) configured to compare the performance of the at least one application (140) with a performance goal of the at least one application. The system further includes an actuator (330) configured to adjust a rate of movement of a set of data from one location in the computer system (100) to another location in the computer system (100). *Specification*, page 10, lines 14-23 (discussing the actuator module 330). The controller (320) is configured to calculate a change in the rate of movement in response to the comparison of the performance of the at least one application (140) and the performance goal and to adjust the rate of movement of the set of data in accordance with the calculated change. *Specification*, page 9, lines 12-16 (discussing migration executor 200).

Claim 16 of the present invention pertains to a computer readable medium on which is embedded one or more computer programs for implementing the method of Claim 1.

Claim 23 of the present invention is similar to Claim 11, in that, Claim 23 also pertains to a system for migrating data on a computer system (100). In addition, the system of Claim 23 includes means for monitoring (310) a performance of at least one application (140) executing on the computer system (100). The system also includes means for comparing (320) the performance of the at least one application (140) with a performance goal of the at least one application. The system further includes means for calculating (200) a change in a rate of movement of a set of data from one location in the computer system (100)

to another location in the computer system (100) and means for adjusting (330) the rate of movement of the set of data according to the change in the rate of movement of the set of data. In addition, the system includes means for determining (320) an error value associated with the performance of the at least one application, where the means for calculating (200) uses the error value to calculate the change in the rate of movement of the set of data.

III. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-23 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 6,636,951 to Tachikawa in view of U.S. Patent No. 6,230,239 to Sakaki et al.

IV. ARGUMENT

A. Discussion of the Law

The test for determining if a claim is rendered obvious by one or more references for purposes of a rejection under 35 U.S.C. § 103 is set forth in MPEP § 706.02(j):

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Therefore, if the above-identified criteria are not met, then the cited reference(s) fails to render obvious the claimed invention and, thus, the claimed invention is distinguishable over the cited reference(s).

Claims 1-23 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Tachikawa in view of Sakaki et al. A *prima facie* case of obviousness has not been established under 35 U.S.C. § 103 because Tachikawa in view of Sakaki et al. fails to teach or suggest all the features of Claims 1-23. To establish *prima facie* obviousness of a claimed invention, all claim elements must be taught or suggested by the prior art. *See, In re Royka*, 490 F.2d 981, USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." See *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

B. The References

1. U.S. Patent No. 6,636,951 to Tachikawa

Tachikawa discloses a data storage system and data relocation method, and to a technique for determining when data is relocated based upon an estimated or current load condition. Column 1, lines 8-13. In this regard, Tachikawa discloses that the load condition is monitored to determine a time slot for initiating the data relocation when the load on the system resource is relatively small. Column 2, lines 26-35. The process of determining the time slot and for performing the data relocation is described with respect to the flowchart shown in Figure 3.

More particularly, Tachikawa discusses that the data relocation is performed during an allocated time slice (or, equivalently, the time slot discussed above). Column 8, line 62-

column 9, line 1. Tachikawa also discloses that the data relocation is suspended when the time slice expires and the data relocation is restarted if the suspended task is allocated another time slice. Column 9, lines 1-5.

Prior to initiation of the data relocation process, Tachikawa discloses that "the controller 11 may select an optimum relocation program simply in accordance with the operational setting requirement, dynamically in accordance with the current or estimated load requirement of the system, or in accordance with the location information stored in the data location information storage section 14." Column 9, lines 26-31. Tachikawa therefore discloses that the so-called "optimum relocation program" pertains to an initial determination of how the data is relocated and does not pertain to control over the manner in which data is relocated during the data relocation process. This distinction is made clearer in column 9, lines 40-50, where Tachikawa discloses that the data relocation process is suspended when a predetermined load value is exceeded or when the task is processed with a sufficient amount of time to terminate the task. Thus, suspension of the data relocation process is not based upon the selected "optimum relocation program", but rather, is based upon a predetermined load value or time period.

2. U.S. Patent No. 6,230,239 to Sakaki et al.

Sakaki et al. pertains to a process for migrating data between storage systems that seeks to enable access to the storage systems prior to completion of the data migration. Column 1, lines 5-12. In one regard, Sakaki et al. discloses that priority is given to accesses to a new volume by automatically adjusting the speed at which data is migrated from the old

volume to the new volume. Column 2, lines 49-54. The migration speed adjustment is described in greater detail with respect to the flowchart depicted in Figure 4 of Sakaki et al.

More particularly, Sakaki et al. discloses that a processing to store information indicating the specified order of priority of data migration is required when conducting a data migration. Column 7, lines 60-62. In this regard, at step 43, Sakaki et al. discloses that the information of data migration sequence priority is acquired. Column 8, lines 4-7. In addition, Sakaki et al. discloses that cache resource information is acquired and compiled, path resource information is acquired and compiled, and old VOL resource information is acquired and compiled. Column 8, lines 7-31. Sakaki et al. further discloses that a determination as to whether migration speed should be changed is made based "on the order of the priority of sequence of data migration and the various resource information." Column 8, lines 32-34. If it is determined that a migration speed should be changed, Sakaki et al. discloses that the there are two items that are adjusted; the number of tracks to be read in at one command chain and the issuing interval of the command chains. Column 8, lines 38-43.

Sakaki et al. further discloses that speed at which data migration occurs is based upon the priority order given to the volumes. As such, Sakaki et al. concludes, that "faster migration of the volume with higher priority is enabled while giving priority to accesses from the CPU during data migration. Column 8, lines 63-67.

C. The Examiner's Position

The Examiner is of the opinion that all of the Claims 1-23 are rendered obvious by the disclosures of Tachikawa and Sakaki et al. More particularly, the Examiner considers Tachikawa as disclosing all of the elements of independent Claims 1 and 16, except for "(c)

calculating a change in a rate of said moving in response to said monitored performance of the at least one executing application; and (d) modifying said rate of said moving in accordance with said calculated change." *January 3, 2005 Official Action*, page 3. The Examiner also considers Tachikawa as disclosing all of the elements of independent Claims 11 and 23, except for "the limitation wherein said controller is further configured to calculate a change in said rate of movement in response to said comparison of said performance and said performance goal and adjust said rate of movement in accordance with the calculated change. *January 3, 2005 Official Action*, bridging paragraph of pages 7 and 8.

In an attempt to make up for these deficiencies, the Examiner relies upon the disclosure contained in Sakaki et al.

With respect first to Claims 1 and 16, the Examiner asserts that column 8, lines 32-36 of Sakaki et al. discloses "modifying the migration speed, i.e. modifying the rate of moving", and that column 8, lines 17-23 and 26-31 of Sakaki et al. discloses that the rate of moving is modified "according to changes in rates calculated based on monitored performance." Based upon these assertions, the Examiner concludes that "it would have been obvious...to supplement the method of Tachikawa with the features taught by Sakaki, so as to calculate a change in a rate of said moving in response to said monitored performance of the at least one executing application, and modify said rate of said moving in accordance with said calculated change, thereby improving performance and access to the data." *January 3, 2005 Official Action*, bridging paragraph of pages 3 and 4.

With respect now to Claims 11 and 23, the Examiner asserts that lines 32-36 in column 8 of Sakaki et al. discloses "adjusting the migration speed, i.e. adjusting the rate of movement", and that lines 17-23 and 26-31 in column 8 of Sakaki et al. discloses that the

migration speed is adjusted "according to changes in rates calculated based on comparisons of performance". The Examiner concludes that it would have been obvious "to supplement the system of Tachikawa" with this disclosure in Sakaki et al. "so as to configure said controller to calculate a change in said rate of movement in response to said comparison of said performance and said performance goal and adjust said rate of movement in accordance with the calculated change, thereby improving performance and access to the data. *January 3, 2005 Official Action*, page 8.

The Examiner further asserts that all of the claims depending upon independent Claims 1, 11, and 16 are taught by the combined disclosures contained in Tachikawa and Sakaki et al.

D. The Appellant's Position

The rejection of Claims 1-23 based upon the disclosures contained in Tachikawa and Sakaki et al. is improper and should be withdrawn for at least the following reasons.

1. Claims 1-20

Tachikawa pertains to a method for relocating data to a data storage system. Column 1, lines 8-13. In the method, a time slot when the load on the system resource is relatively small is determined. Column 2, lines 26-35. In addition, the data relocation process is assigned to the time slot, such that, the data relocation is performed during the allocated time slot. Column 8, line 62-column 9, line 1. Tachikawa discloses that the relocation process is suspended when a predetermined load value is exceeded or when the data relocation task is processed with a sufficient amount of time to terminate the task. Column 9, lines 40-50.

More particularly, Tachikawa discloses that the controller performs a termination process, suspending the relocation of data, if the requirement of suspension is met. Column 10, lines 5-22. Alternatively, Tachikawa discloses, that if the load condition is low, or below a predetermined threshold, the data relocation process continues according to the predetermined plan. Column 12, lines 34-51.

As seen from the description above, Tachikawa discloses a simple on/off arrangement for relocating data whereby data is moved when the load condition is low and is not moved when the load condition is high. As such, Tachikawa fails to disclose each and every element claimed in Claims 1, 11, and 16. To further demonstrate this point, the following paragraph describes the differences between the claimed invention and the Tachikawa disclosure in greater detail.

Claims 1, 11, and 16 recite, *inter alia*, that a change in a rate at which a set of data is moved is calculated in response to a monitored performance of at least one application. Claims 1, 11, and 16 also recite that the rate at which the set of data is moved is modified in accordance with the calculated change in moving rate. Although the Examiner has correctly noted that Tachikawa fails to disclose these claimed features, a discussion of the differences is provided to further identify the differences between the claimed invention and Tachikawa.

In one respect, Tachikawa fails to disclose that the change in the rate at which a set of data is moved is calculated. In addition, Tachikawa fails to disclose that the rate at which the set of data is moved is modified based on the performance of at least one application as recited in Claims 1, 11, and 16. In fact, Tachikawa, as described above, uses a simple on/off arrangement for moving data from one location to another. That is, either data is transferred during a low load condition or not transferred during a high load condition. In this regard,

there is no mechanism disclosed in Tachikawa for regulating the rate at which data is moved by calculating a change in rate based on the load condition.

The Examiner relies upon the disclosure contained in Sakaki et al. in an effort to make up for the deficiencies of Tachikawa. More particularly, the Examiner asserts that lines 32-36 in column 8 of Sakaki et al. discloses a method for migrating data in which the migration speed, that is, the rate of moving, is modified. In addition, the Examiner asserts that lines 17-23 and 26-31 in column 8 of Sakaki et al. discloses that changes in the rate of moving are calculated based on monitored performance. Based upon this alleged disclosure in Sakaki et al., the Examiner concludes that "[i]t would have been obvious...to supplement the method of Tachikawa with the features taught by Sakaki, so as to calculate a change in a rate of said moving in response to said monitored performance of the at least one executing application, and modify said rate of said moving in accordance with said calculated change, thereby improving performance and access to the data."

Initially, it is respectfully submitted that the Examiner does not assert that Sakaki et al. discloses that a performance of at least one executing application is monitored, as set forth, for instance, in Claim 1 of the present invention. In fact, Sakaki et al. does not disclose that a performance of at least one executing application monitored at all. Instead, in lines 7-31 of column 8, Sakaki et al. discloses that cache resource information is acquired and compiled, a path resource information is acquired and compiled, and that an old VOL (disk volume) is acquired and compiled. As such, there is nothing in this cited passage of Sakaki et al. to indicate that the performance of at least one executing application is monitored.

Secondly, the Examiner has mischaracterized the passages contained in lines 17-23 and lines 26-31 of column 8 as disclosing that a rate at which data is moved is modified

according to changes in rates calculated based on monitored performance. The passage contained in lines 17-23 instead pertains to an "average queuing time of the command chains for data migration...**the rate of the change of the average value** is calculated using past information." (emphasis added). In addition, the passage contained in lines 26-31 pertains to a "sum of the existence of contentions, **the rate of the change of the existence of contentions** is calculated using past information." (emphasis added).

The above-cited passages discuss changes to the rates of the average queuing time and the existence of contentions, respectively, and thus do not discuss calculating a change in the rate at which a set of data is moved in response to a monitored performance of at least one executing application. These passages also fail to disclose that the rate at which the set of data is moved is modified in accordance with the calculated change.

Thirdly, the passage contained in lines 32-47 of column 8 in Sakaki et al. discuss when and how migration speed should be changed. More particularly, that passage indicates that the migration speed is changed "[w]hen the various resource information indicates the tendency of an increase of access by the CPU, the number of the tracks to be read in is reduced or the issuing interval of the command chains issued by the CPU that have been given priority is lengthened." Thus, Sakaki et al. discloses that modifications to the migration speed is directly correlated to the access requirements by the CPU to the storage systems. In other words, Sakaki et al. decreases migration speed to the new VOL to thereby enable priority access to the new VOL if there is a relatively large number of accesses to the new VOL. See, for instance, Column 8, lines 63-67.

Clearly, therefore, Sakaki et al. does not disclose that a change in the rate at which a set of data is moved is calculated in response to a monitored performance of at least one

executing application. Sakaki et al. also fails to disclose that the rate at which the set of data is moved is modified in accordance with the calculated change.

Thus, regardless of the reasons set forth by the Examiner promoting a combination of Tachikawa and Sakaki et al., the proposed combination would still fail to yield the present invention as set forth in Claims 1, 11, and 16. More particularly, for instance, the proposed combination would fail to yield a controller configured to calculate a change in the rate at which a set of data is moved in response to a comparison of the performance of at least one executing application and a performance goal as set forth in Claim 11. Moreover, the proposed combination would fail to disclose that the controller is configured to adjust the rate at which the set of data is moved in accordance with the calculated change, as also set forth in Claim 11.

It is thus respectfully submitted that the Examiner has failed to prove that the proposed combination of Tachikawa and Sakaki et al. would include all of the claimed elements because, as presented above, the proposed combination would not include all of the elements Claimed in Claims 1, 11, and 16 and the claims that depend therefrom. Accordingly, even assuming for the sake of argument that the proposed modification of Tachikawa with the disclosure contained in Sakaki et al. were proper, the proposed combination would still fail to yield all of the elements of Claims 1, 11, and 16 of the present invention.

In addition, for at least the foregoing reasons, the Official Action has failed to establish a prima facie case of obviousness. "To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). 'All words in a claim must be

considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)."

The rejection of Claims 1-20 is therefore improper and should be withdrawn.

2. **Claims 21-23**

The Examiner asserts that Claims 21-23 are rejected for reasons similar to those set forth with respect to Claims 1-20. In addition, the Examiner relies upon disclosure contained in Sakaki et al. in addition to that described above. More particularly, the Examiner argues that the proposed combination of Tachikawa and Sakaki et al. discloses means for determining an error value associated with the performance of at least one application. See *January 3, 2005 Official Action*, page 12, referring to the rejection of Claim 22. This assertion, however, is improper because neither Tachikawa nor Sakaki et al. disclose this feature.

More particularly, the proposed combination would still fail to disclose that an error value for the performance of at least one executing application is calculated and that the error value is used to calculate the change in the rate of the moving as claimed in Claim 21. The proposed combination would additionally fail to disclose a controller for performing these features as set forth in Claim 22 and a means for performing these features as set forth in Claim 23.

The Examiner asserts that Sakaki et al. discloses these features in the passage contained in column 7, line 63 to column 8, line 2 (apparently stating that a contention value is equivalent to an error value). Initially, it is not at all clear as to how the Examiner arrived

at the conclusion that a contention value and an error are equivalent. Clearly, there is nothing in the above-cited passage to indicate that a contention value is equivalent to an error value.

Even assuming for the sake of argument, however, that the contention value is somehow equivalent to an error value, the proposed combination is deficient for a number of reasons. For instance, the proposed combination would still fail to disclose that a change in a rate of movement is calculated using the error value to calculate the change in movement as claimed in Claim 21. Instead, and as described above, Sakaki et al. discloses that the migration speed is modified according to the number of accesses attempted on the old and new volumes. Column 8, lines 32-47.

The Examiner also asserts that Tachikawa and Sakaki et al. may somehow be combined to disclose all of the features of Claims 21-23 without describing how Tachikawa is to be modified based upon the Sakaki et al. disclosure. In addition, the Examiner has not provided any motivation for the proposed combination of Tachikawa and Sakaki et al. As such, the Examiner has clearly failed to establish a proper rejection of Claims 21-23 under 35 U.S.C. § 103.

For at least the foregoing reasons, the Official Action has failed to establish a prima facie case of obviousness with respect to Claims 21-23. "To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). 'All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)."

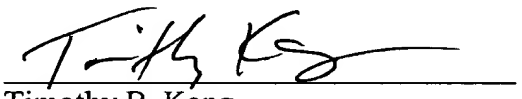
The rejection of Claims 21-23 is therefore clearly improper and should be withdrawn.

V. CONCLUSION

For at least the reasons set forth above, it is respectfully submitted that the rejection of Claims 1-23 is improper. The Appellant therefore respectfully requests that the Board of Patent Appeals and Interferences reverse the Examiner's decision rejecting Claims 1-23 and to direct the Examiner to pass the case to issue.

Respectfully submitted,

Guillermo A. Alvarez et al.

Dated: June 1, 2005 By 

Timothy B. Kang
Registration No. 46,423

MANNAVA & KANG, P.C.
8221 Old Courthouse Road
Suite 104
Vienna, VA 22182
(703) 652-3817
(703) 880-5270 (facsimile)

CLAIMS APPENDIX

The Appealed Claims:

1. A method for migrating data, said method comprising:

moving a set of data in a data storage system of a computer system;

monitoring a performance of at least one executing application, while said moving is in progress;

calculating a change in a rate of said moving in response to said monitored performance of the at least one executing application; and

modifying said rate of said moving in accordance with said calculated change.

2. The method for migrating data according to claim 1, further comprising:

setting a performance goal for said at least one executing application, wherein said rate of said moving is increased in response to said monitoring of said performance exceeding said performance goal.

3. The method for migrating data according to claim 1, further comprising:

setting a performance goal for said at least one application, wherein said rate of said moving is decreased in response to said monitoring of said performance not achieving said performance goal.

4. The method for migrating data according to claim 1, further comprising:

inputting an initial placement of said set of data;

inputting a target placement of said set of data;

developing a migration plan, said migration plan configured to plan said moving of said set of data from said initial placement to said target placement; and

executing said migration plan to implement said moving of said set of data.

5. The method for migrating data according to claim 4, further comprising:

setting a performance goal for said at least one executing application; and

wherein said monitoring of said performance is conducted at a periodic sampling interval.

6. The method for migrating data according to claim 5, further comprising:

modifying said rate after said periodic sampling interval in response to said performance of said at least one executing application.

7. The method for migrating data according to claim 6, further comprising:

increasing said rate in response to said performance of said at least one executing application exceeding said performance goal.

8. The method for migrating data according to claim 6, further comprising:

decreasing said rate in response to said performance of said at least one executing application exceeding said performance goal.

9. The method for migrating data according to claim 5, further comprising:

setting a violation goal, wherein said violation goal is a maximum percentage of performance violations of all accesses; and

restricting, based on the results of said monitoring, said performance violations not to exceed said violation goal.

10. The method for migrating data according to claim 1, wherein:

said set of data is moved in increments of portions contained within a logical volume.

11. A system for migrating data on a computer system, said system comprising:

a monitor configured to monitor a performance of at least one application executing on said computer system;

a controller configured to compare said performance with a performance goal of said at least one application; and

an actuator configured to adjust a rate of movement of a set of data from one location in said computer system to another location in said computer system, wherein said controller is further configured to calculate a change in said rate of movement in response to said comparison of said performance and said performance goal and adjust said rate of movement in accordance with the calculated change.

12. The system for migrating data on a computer system according to claim 11, further comprising:

a logical volume mover configured to move data in increments of portions contained within a logical volume, wherein said actuator is further configured to issue commands to a manager of said logical volume to adjust said rate of movement of said set of data.

13. The system for migrating data on a computer system according to claim 12, further comprising:

a planner configured to generate a migration plan in response to an input of an initial placement map of said set of data and a target placement map of said set of data, wherein said migration plan is configured to provide a partially ordered set of moves for said set of data and to be executed by said actuator.

14. The system for migrating data on a computer system according to claim 12, wherein:

said actuator is further configured to issue a command to increase said rate of movement of said set of data in response to said controller determining said performance exceeds said performance goal.

15. The system for migrating data on a computer system according to claim 12, wherein:

said actuator is further configured to issue a command to reduce said rate of movement of said set of data in response to said controller determining performance does not achieve said performance goal.

16. A computer readable medium on which is embedded one or more computer programs, said one or more computer programs implementing a method for migrating data on a computer system, said one or more computer programs comprising a set of instructions for:

moving a set of data in a data storage system of a computer system;

monitoring a performance of at least one application executing on a computer system;

calculating a change in a rate of said moving in response to said monitored performance of the at least one application; and

modifying said rate of said moving in accordance with said calculated change.

17. The computer readable storage medium according to claim 16, said one or more computer programs further comprising a set of instructions for:

inputting an initial placement of said set of data;

inputting a target placement of said set of data;

developing a migration plan, said migration plan configured to plan said moving of said set of data from said initial placement to said target placement; and

executing said migration plan to implement said moving of said set of data.

18. The computer readable storage medium according to claim 17, said one or more computer programs further comprising a set of instructions for:

setting a performance goal for said at least one executing application, wherein said monitoring of said performance is conducted at a periodic sampling interval.

19. The computer readable storage medium according to claim 18, said one or more computer programs further comprising a set of instructions for:

setting a violation goal, wherein said violation goal is a maximum percentage of performance violations of all accesses; and

restricting, based on the results of said monitoring, said performance violations not to exceed said violation goal.

20. The computer readable storage medium according to claim 18, said one or more computer programs further comprising a set of instructions for:

modifying said rate after said periodic sampling interval in response to said performance of said at least one application.

21. The method for migrating data according to claim 1, further comprising:

calculating an error value for the performance of said at least one executing application; and

using said error value to calculate said change in said rate of said moving according to a control theory technique.

22. The system for migrating data according to claim 11, wherein said controller is further configured to calculate an error value for said performance of said at least one application and to calculate said change in said rate of movement using said error value in at least one control theory equation.

23. A system for migrating data on a computer system, said system comprising:

means for monitoring a performance of at least one application executing on said computer system;

means for comparing said performance with a performance goal of said at least one application;

means for calculating a change in a rate of movement of a set of data from one locating in said computer system to another location in said computer system;

means for adjusting said rate of movement of said set of data according to said change; and

means for determining an error value associated with said performance of said at least one application, wherein said means for calculating uses said error value to calculate said change in said rate of movement.

EVIDENCE APPENDIX

No evidence is submitted herewith.

RELATED PROCEEDINGS APPENDIX

No copies of decisions rendered by a court of the Board is submitted herewith.